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COORDINATION QUESTIONS: INTERNATIONAL COOPERATION IN THE FIELD OF INFORMATICS

Harmonization and improvement of United Nations informatics systems for optimal utilization and accessibility by all States

Report of the Secretary-General

SUMMARY

In its resolution 1991/70, the Economic and Social Council requested the Secretary-General to prepare, within existing resources and in consultation with representatives of States, a study analysing the causes of the current situation with respect to United Nations informatics systems and providing an outline of a rapid solution to the problem, leading to easy, economical, uncomplicated and unhindered access to United Nations computerized databases and information systems and services, which are of great importance to all States, in particular to the developing countries.

In addition to containing an analysis of the causes of the present situation, the present report summarizes the results of a questionnaire submitted to all missions of Member States in New York and Geneva and describes the status of the most-requested United Nations databases, as well as the database activities of the regional commissions. Those activities undertaken in immediate response to resolution 1991/70 are discussed, and problems still to be addressed are identified, namely, the need for

* E/1992/100.

user-friendly access, the need for a continuous flow of information to Member States, the need to provide easier physical access to databases, the need for training, the need for policy coordination and the need to expand the on-line access process beyond the Organization to the United Nations system as a whole.

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INTRODUCTION

1. In its resolution 1991/70, the Economic and Social Council requested the Secretary-General to prepare, within existing resources and in consultation with representatives of States, a study analysing the causes of the present situation with respect to United Nations informatics systems and providing an outline of a rapid solution to the problem, leading to easy, economical, uncomplicated and unhindered access to United Nations computerized databases and information systems and services, which are of great importance to all States, in particular to the developing countries.

Causes of the present situation

2. The convergence of the availability of comparatively inexpensive microcomputer technology with the advent of constantly declining prices for use of global telecommunications networks has provided missions with the ability to acquire the resources needed for access to United Nations databases. However, several of the major databases were designed and implemented in the 1970s, when the available database software packages were not designed for easy retrieval by non-technical users. In addition, each database was conceived and implemented independently of the others, over a span of two decades, using different software. Not only was each system developed by a different substantive office, but each target audience was presumably different as well. Therefore, prior to the advent of microcomputers, there was little or no impetus to establish a standardized method (standard user interfaco) for accessing databases.

3. Although Member States have had direct dial access to United Nations databases since 1986, the procedures for gaining access are not widely known. Often access is requested when a particular office or department in a Member State learns about a specific database, such as the bibliographic data system of the Dag Hammarskjold Library of the United Nations Secretariat or the statistical database of the Statistics Division of the Department of Economic and Social Development of the United Nations Secretariat. While more than 56 missions have access to the New York Computer Section (NYCS) mainframe computer, there has been no systematic, centralized effort to keep missions informed, and this has contributed to the overall confusion and frustration among the missions regarding access to United Nations material. It should be noted that access to United Nations databases has also been of concern to the regional commissions and other offices away from Headquarters (see paras. 18-24 below).

Questionnaire to missions

4. As a preliminary step to determine more specifically the status of the technological infrastructure in the missions of Member States in New York and Geneva, and to identify the types of information of particular interest to them, the United Nations, in consultation with representatives of the permanent missions, prepared and circulated a questionnaire (see annex).

5. The response was unusually high for a direct mail questionnaire, indicating a high degree of interest on the part of the missions: of 350 questionnaires circulated, 123 replies were received - 46 from Geneva and 77 from New York.

6. Eighty-five per cent of those responding indicated that they used microcomputers (PCs) in support of their work, with 56 per cent having between one and five machines. Sixty-four missions, among which 13 currently had no equipment, indicated plans to acquire machines in 1992. The vast majority used PCs for word processing. However, a significant number also used the machines for electronic mail (23 per cent), accounting programs such as spreadsheets (38 per cent), access to databases (23 per cent) and individual databases (36 per cent).

7. The replies indicated a high degree of computer awareness on the part of the staff of missions. Microcomputer users at the missions fell into either the professional or the clerical category, with 70 per cent of those in the former category and 80 per cent of those in the latter using the machines.

8. To the question "Does the mission regularly receive information (about databases) from the United Nations Secretariat, from other organizations and agencies of the United Nations system, from the International Computing Centre (ICC) or from the Advisory Committee for the Coordination of Information Systems (ACCIS)?", the distribution of those responding yes was as follows: Secretariat, 20 per cent; other organizations and agencies, 8 per cent; ICC, 7 per cent; and ACCIS, 14 per cent. To questions about the accessing of specific United Nations databases, 27 per cent indicated that they accessed the United Nations Bibliographic Information System (UNBIS), the bibliographic database; 8 per cent, the statistical database; and 28 per cent, the on-line press releases.

9. The distribution of replies to the question "What United Nations information would you like to access?" was as follows:

Text of documents	79 per cent
Text of resolutions	76 per cent
Text of treaties	72 per cent
Press releases	65 per cent
Bibliographic data	53 per cent
Statistical data	50 per cent

I. STATUS OF MOST-REQUESTED UNITED NATIONS DATABASES

Text of documents

10. As noted above, 79 per cent of the respondents indicated their interest in access to the full text of documents, confirming interest expressed by the General Assembly when it adopted resolution 44/201. Full-text accessibility of United Nations documents has long been considered a desirable goal, both by

Member States and by the United Nations Secretariat. However, until the development of optical storage technology, implementation of full-text storage and retrieval was not feasible. As has been the case with most technological developments over the last several years, the cost of the technology has continued to decline, the technology itself evolving to a point where it has now become feasible to implement a full-scale project. The optical disk project (see A/C.5/46/26) is now being implemented with the installation of an operational system in both New York and Geneva currently at the stage of final testing; it will initially provide full-text access to users with communications links to host minicomputers in New York and Geneva. The operational system now being installed will in the first phase enable missions to retrieve documents in all official languages by direct dialling. In later stages, Governments themselves and eventually other users will be able to access the system, which is designed as a world-wide network.

Text of resolutions

11. The text of resolutions was identified by 76 per cent of the respondents as one of the most desirable items of information for missions. While the optical disk system will provide this material as part of the documents database, it is now provided to a limited degree in English only by the United Nations Bibliographic Information System (UNBIS). Resolutions of the General Assembly from its thirty-sixth session (1981), resolutions of the Security Council from its twenty-ninth year (1974) and resolutions of the Economic and Social Council from its 1982 session are retrievable from the UNBIS database. The United Nations press release system (see para. 13 for further details) contains the text of Security Council resolutions included in press releases issued on the day of adoption. However, those resolutions are retained in the database for one month only.

Text of treaties

12. Interest in access to the full text of treaties was indicated by 72 per cent of the missions. While United Nations documents will be retrievable in the six official languages of the Organization on the optical disk system, the question of languages in the case of treaties is somewhat more complex, as agreements in the United Nations Treaty Series are published in the original languages of the treaties as well as in English and French. This material lends itself ideally to the use of another form of optical storage, CD-ROM (compact disk read only memory). The entire Treaty Series, consisting of over 1,500 volumes and 600,000 pages, could be stored on a single compact disk. Most major libraries now have compact disk readers, which are relatively inexpensive devices that can be attached to microcomputers. In answer to questions on CD-ROM, 10 per cent indicated that they currently used the technology, and another 25 per cent indicated their intention of acquiring it in the biennium 1992-1993. The Treaty Section of the Office of Legal Affairs of the United Nations Secretariat is currently studying how to implement the production of the Treaty Series using CD-ROM.

Press releases

13. Sixty-five per cent of the respondents wanted access to the daily press releases issued by the Department of Public Information of the United Nations Secretariat and stored in the United Nations Press Release Retrieval System (UNPRESS) system. UNPRESS is currently available on line on both the NYCS and ICC mainframes. (ICC, established in 1971 to implement resolution 2741 (XXV) of the General Assembly, is a cooperative computing facility in Geneva that operates on a pay-for-service basis. Currently 21 participating United Nations entities account for 99 per cent of the total usage. Access to ICC is also available to Member States on a pay-for-service basis.) The access menus to UNPRESS are different in New York and Geneva, and efforts will be made to ensure that the access menus are the same on both platforms. The Journal of the United Nations is also part of the information in this system, and the Department of Public Information will consult with the Office of Conference Services of the United Nations Secretariat about the possibility of adding the daily list of documents, so that independently from the optical disk system, which will also provide this information, missions will have knowledge of at least the symbol, language and title of documents on the day they are issued. The press releases in UNPRESS and other Department of Public Information material are also available through a fee-charging, on-line, public-access service called UNISER (United Nations Information Services), operated by a non-governmental organization.

Bibliographic data

14. Fifty-three percent of the missions indicated an interest in bibliographic material. The UNBIS database has been housed on the NYCS mainframe since 1979 and was made directly accessible to permanent missions in 1986. As of 1 June 1992, 60 Member States and 3 regional intergovernmental organizations were linked to UNBIS at their permanent missions in New York. Among those Member States, six had additional access through their missions in Geneva or Vienna and six had on-line access through government ministries in their home countries. In order to provide more widespread access to UNBIS data, the Dag Hammarskjold Library contributes to the Research Libraries Information Network (RLIN) database, which is accessible world wide via standard telecommunications networks.

15. UNBIS contains bibliographic references to the official documentation issued by the Organization since 1979; the documentation, inter alia, from the United Nations Conference on Trade and Development (UNCTAD) and from the regional commissions, as well as significant documents from agencies of the United Nations system; significant documents from other agencies of the common system that relate specifically to United Nations issues; and non-United Nations material acquired by the Dag Hammarskjold Library since 1980. Users in Geneva can access this material through the ICC-NYCS telecommunications link. The Library is currently working on a major re-engineering of this system that, like the optical disk database, will be housed on a dedicated minicomputer. Once the gateway computer is operational, however, the new UNBIS system will be accessed through the single entry point discussed in

paragraph 27 below. The issuing of UNBIS bibliographic, authority, factual and full-text (Security Council resolutions) files as a CD-ROM product in the near future is also planned.

16. The ACCIS secretariat has begun work on a pioneering effort to bring together on a single CD-ROM all bibliographic citations to publications in the United Nations system of organizations that are now available in machine-readable form. It is expected that this database will be available by late summer, 1993.

Statistical data

17. Member States have had access to United Nations statistical data in machine-readable form since the installation of the mainframe computing facility at Headquarters in 1965. Originally, data were supplied on magnetic tape in response to requests from Governments interested in obtaining electronic copies of the commodity trade statistics data of the Compressed International Trade Database (COMTRADE). Commodity trade data are now available on line through the United Nations Statistical Information System (UNSIS). UNSIS, which provides on-line access to a variety of statistics, was developed and is supported by the Statistics Division of the Department of Economic and Social Development of the United Nations Secretariat. In 1986, the retrieval modules were redesigned and enhanced to allow access to users outside the Statistics Division. At present, in addition to COMTRADE, national accounts, industrial production and energy databases, as well as population estimates and price indices files, are available in UNSIS. Significant changes are planned for UNSIS on an evolutionary basis, as resources become available. For example, the Statistics Division is in the process of making UNSIS databases and files available on an interactive basis with microcomputers working through networks that make them more user-friendly.

Activities of the regional commissions and major programmes

18. The regional commissions, by virtue of their mission, have long supplied data to the Member States in their areas. Many promising experimental programmes have been initiated in the regional commissions. For example, the Economic Commission for Europe (ECE) is offering Member States on-line access to the ECE Statistical Database (ECESDB), which is housed on the ICC computer. In addition, a member country has offered a PC software package that has been developed particularly for the dissemination of statistical data on diskettes. This program contains facilities for retrieving and organizing information from diskettes, as well as organizing materials retrieved from databases stored on the mainframe computer. ECE intends to use this product to improve accessibility to its statistical data and to facilitate dissemination by using a standard format.

19. Within the Economic Commission for Africa (ECA), access to ECA databases, information systems and services is possible through ECA's Pan African Documentation and Information System (PADIS). In 1990, PADIS launched a pilot project on electronic networking in order to provide increased access to its

information systems and databases. The project uses microcomputer-based communications technology, with messaging/conferencing software installed to provide dial-up data communications for electronic mail, bulletin boards and conferencing. The project has also set up public on-line access to the databases maintained on the ECA minicomputer. Users with appropriate terminal emulation software can dial up and access referral, bibliographic and text databases. It should be noted, however, that the high cost of telecommunications in member States of the Commission, together with the unsuitability for data transmission of the telephone service in some countries, limits the utilization of the system.

20. The Economic and Social Commission for Asia and the Pacific (ESCAP) has been working in coordination with United Nations Headquarters to ensure that its evolving technological innovations infrastructure conforms to international standards for open systems and is in harmony and fully integrated with the United Nations computer and communications network. Concurrently, ESCAP has been involved in coordination with its sectoral network of national focal points in member Governments to promulgate standard means of transmitting numerical, bibliographic and textual information and data.

21. The Economic and Social Commission for Western Asia (ESCWA) has disseminated data on energy, the labour force and population on diskettes to the Governments requesting the material. These databases are currently housed on stand-alone microcomputers, but the ESCWA Technological Innovations Committee is addressing issues related to the further development of databases and the dissemination of their contents.

22. The Economic Commission for Latin America and the Caribbean (ECLAC) maintains databases of economic, social and demographic statistics, as well as bibliographic references to books, articles, research reports and other documents in the economic, social and demographic fields. ECLAC regularly disseminates its databases on diskettes and magnetic tapes, and currently, the bibliographic databases are available on CD-ROM. In order to meet the needs of the countries facing shortages in telecommunications resources, ECLAC plans to disseminate information on self-contained magnetic and CD-ROM media. This means that diskettes will contain not only the data itself, but also the appropriate software needed for searching and retrieving the information needed by the users. (The Technical Working Group on Statistical Databases of the ACC Subcommittee on Statistical Activities, during its 9th meeting, held in Geneva from 29 April to 1 May 1992, made a specific recommendation regarding the provision of self-contained systems. It was generally agreed that provision of self-contained systems was the most economical option for data dissemination, being both inexpensive and easy to use. Such systems facilitate access by users to the data they require; those data may be easily downloaded for further processing using whatever software the users prefer.)

23. The United Nations Centre for Human Settlements (Habitat), with headquarters in Nairobi, maintains bibliographic and statistical databases. A policy providing Member States with access to databases through the dissemination of self-contained products has been followed by the Centre since

1989. Searches in the bibliographic database are conducted in response to ad hoc requests, and the results are mailed either in the form of either a printout or a file on diskette. Access to the statistical database, which contains material relevant to human settlements, is secured through regular dissemination of the complete system on diskettes to all member States of the Commission on Human Settlements. The complete database product runs on a standard personal computer; and no user manual is needed, as it is completely menu-driven and user-friendly.

24. For a number of years, the United Nations Conference on Trade and Development (UNCTAD) has been collecting and disseminating trade control measures information in the form of diskettes, and UNCTAD is currently studying the possibility of using CD-ROM as well.

II. ACTIVITIES IN IMMEDIATE RESPONSE TO ECONOMIC AND SOCIAL COUNCIL RESOLUTION 1991/70

25. Since the adoption by the Economic and Social Council on 26 July 1991 of resolution 1991/70, the following undertakings have aimed at addressing some of the issues raised by the Council in the resolution:

(a) At United Nations Headquarters, activity has centred on identifying more precisely what missions require in terms of access to United Nations databases (see paras. 4-9 above);

(b) The United Nations has joined Internet, a network of networks, in order, inter alia, to facilitate access to our systems by Member States;

(c) The Electronic Services Division of the Office of General Services of the Department of Administration and Management of the United Nations Secretariat is developing plans for installing common gateway computers to simplify access to the main database systems;

(d) The Advisory Committee for the Coordination of Information Systems (ACCIS) organized a seminar, in which representatives of the United Nations Office at Geneva, ICC and the Diplomatic Committee in Geneva participated for the purpose of explaining to mission delegates the role of ACCIS and its products in facilitating access to databases of the United Nations system;

(e) The United Nations Institute for Training and Research (UNITAR) has met with representatives of the Diplomatic Committee in Geneva to explore the possibility of organizing training seminars for mission staff. Pursuant to this question, discussions have been held between the United Nations staff and UNITAR on the contents of a possible training programme in computer literacy for the diplomatic communities in Geneva and New York;

(f) ICC is developing a facility to allow user-friendly connectivity to the various computing facilities linked to it. It should be noted that this is a first step towards providing convenient on-line access to United Nations databases. However, the format of the screens presented to the user remains the responsibility of the respective substantive offices.

III. PROBLEMS TO BE ADDRESSED, NEAR- AND LONGER-TERM SOLUTIONS AND THE COSTS THEREOF

26. The costs of the activities initiated in immediate response to resolution 1991/70 (para. 25 above) have been absorbed within existing resources, as will be the case with implementation of many of the activities discussed in paragraphs 27-31. In addition, certain projects fall within the regular programme of work of the substantive departments and offices responsible for them and are therefore represented in the programme budgets and work programmes of those units. However, to mount a truly effective, continuous effort, a professional post dedicated to coordinating the technical and informational aspects of improving access to Member States, not only in New York and Geneva, but also within the Member States themselves, would be needed in the Electronic Services Division of the Office of General Services of the United Nations Secretariat as well as in the Management Systems Section in the Budget and Management Systems Service of the Division of Administration at the United Nations Office at Geneva.

Need for user-friendly access

27. Responses to the questionnaire, as well as direct contact with missions, have served to highlight several needs that the United Nations must address in both the immediate and long term. The first priority is the need to make the access to existing United Nations databases easier for missions. Several activities can be initiated to meet this requirement:

(a) The substantive offices responsible for each database should investigate how, through programme modifications, the screens can be simplified. It should be noted, however, that major modifications will entail serious investment, with cost implications that could be determined only after the changes needed have been identified. Accordingly, the extent and timing of implementation of these measures would depend upon the overall availability of resources and relative priorities in each programme;

(b) In the longer term, efforts should be directed at developing a standard user interface. An ACCIS technical panel, including a pilot project involving selected missions in New York and Geneva, may be the most appropriate mechanism for addressing this issue. The United Nations focal point for ACCIS will raise this question of a technical panel as part of the 1993 ACCIS programme plan;

(c) The NYCS help desk should enhance the hot line services provided to missions in New York. This activity can be accommodated on a limited basis within existing resources. The Geneva community can be served directly by the ICC help desk or by NYCS via electronic mail. The funding situation at ICC is more complex, as it is funded on a fee-for-service basis, and the costs of an expanded help desk are more difficult to determine;

(d) In terms of registration for access to the ICC and the NYCS mainframes, a mutually satisfactory procedure should be established that

simplifies the registration process. This activity can be undertaken with existing resources;

(e) Linked to the ease of use of any particular system is the need to provide a single access point to all the available on-line systems, irrespective of the host platform of any particular database. For example, the optical disk project is designed so that the database is housed on a minicomputer; the same is true of the new UNBIS. Making a single call to a central routing computer, rather than having to dial different machines, can simplify access for the user. The possibility of providing for the acquisition of a gateway computer, which will allow for a single point of entry to the major on-line databases, will therefore be considered in the context of the preparation of the proposed programme budget for the biennium 1994-1995.

Need for a continuous flow of information to the Member States

28. A second requirement is to keep Member States fully and continuously informed regarding United Nations database activities. To further the meeting of this requirement:

(a) NYCS will develop an outreach programme that will encompass regularly scheduled meetings; the formation of user groups for databases of specific types (for example, statistical and bibliographic) to advise on the continuing process of system enhancement; and, if resources permit, a newsletter. These activites in and of themselves do not require additional resources. As was stated in paragraph 26 above, the entire constellation of activities associated with a coordinated approach to the improvement of access would necessitate an additional professional post in both New York and in Geneva. Clerical activities can be absorbed within existing resources;

(b) Similar activities, in Geneva, may be organized through the cooperation of the United Nations Office at Geneva, ACCIS and ICC. In addition, there should be an ICC-mission user group that is convened at least once a year;

(c) The United Nations should conduct periodic evaluations by questionnaire to ensure that the outreach programme is effective;

(d) An analysis should be made to determine the costs of producing a frequently updated version of Directory of United Nations Databases and Information Services (DUNDIS), the catalogue of databases available on line on the ICC and NYCS mainframes.

Need to have easier physical access to the databases

29. With regard to a third area to be addressed, relating to the physical availability of the data itself:

(a) More material should be made available on CD-ROM, which is a convenient and inexpensive technology for disseminating information, especially text material, such as treaties and resolutions. Cost-benefit studies of each application would be needed;

(b) For the older databases, where modifications are already being considered, the substantive offices should also investigate the possibility of re-engineering their databases to take advantage of newer technologies;

(c) When new databases are being designed, the substantive offices responsible must recognize ease of access as a prime requirement from the inception of the project;

(d) The contents of some of the existing databases might be expanded at little or no additional cost. For example, the Department of Public Information of the United Nations Secretariat may consider broadening the coverage of the UNPRESS system to include other Department of Public Information materials as well as the daily list of documents from the Office of Conference Services.

Need for training

30. Representatives of Member States have indicated an interest in courses in computer literacy. To this end UNITAR, with the advice and cooperation of the Electronic Services Division of the Office of General Services of the United Nations Secretariat (in addition to two briefings for missions on databases), is developing a series of one-hour seminars aimed at familiarizing mission staff with the basic concepts in computer technology. The United Nations will also organize, within existing resources, ad hoc seminars relating to specific databases. The cost and means of financing the UNITAR programme are yet to be determined.

Need for policy coordination

31. There is a need for a more coordinated approach to the subject of access, and access policies must be addressed, with attention paid to the marketing aspects of the subject. Specifically:

(a) The United Nations, through its Technological Innovations Board and technological innovations committees, should promulgate policies for the Organization relating to access to databases;

(b) Ease of access should be established as a prime consideration in the design and implementation of all new databases;

(c) Another longer-term project will be to incorporate the recommendation of the Technical Working Group on Statistical Databases of the ACC Subcommittee on Statistical Activities, mentioned above, by making the on-line systems self-contained, with the data easy to download.

32. Although the focus of the present report has been on the provision of improved access to United Nations databases, it is also important to expand service to Member States desiring access from their home countries. The United Nations has taken steps, as part of its ongoing efforts to upgrade its telecommunications infrastructure, to join public and private data networks. As the costs of telecommunications continue to decline, Member States will be able to benefit from a wider availability of access. A second benefit will be the ability of the missions to exchange, via electronic mail, drafts of resolutions and other documents with each other and with United Nations officials responsible for the substance of such material.

33. Finally there is a need to go beyond the confines of the United Nations itself and to coordinate questions of access and access policy with other entities in the common system. The ACCIS technical panel on standards would be a first step in this direction. Ultimately, when resources permit, consideration should be given to opening the access process to non-United Nations users.

IV. RESOURCE IMPLICATIONS

34. The following items entail the costs that are directly attributable to the database access activities noted in the body of the report, especially in paragraphs 26 to 32. (No additional requirements would arise in the current biennium. Inclusion of provisions for such activities in the proposed programme budgets for 1994-1995 and subsequent bienniums would depend on technical factors as well as on the overall availability of financial resources and the relative priorities of activities proposed.)

(a) Two Professional posts at the P-3 and P-4 level respectively. These would be required to perform the outreach and coordination functions in the United Nations Secretariat in New York and Geneva;

(b) Provision of a single point of entry to the system of databases, regardless of the location of the computers on which the various systems are located, estimated as follows:

(i) One-time costs (total: $226,000):

a. UNIX processor (RISC-type architecture), including 20 dial-up ports and X.25 communications capability ($100,000);

b. TCP/IP communications to mainframe link ($70,000);

c. Software development ($50,000);

d. Installation of 20 trunk lines at $300 each ($6,000);

(ii) Recurring costs (total: $32,000):

a. Annual computer/software maintenance ($20,000);

b. Rental of trunk lines at $50 per line per month ($12,000).

35. The cost of re-engineering specific existing databases will be considered, subject to resource availability and relative priorities, in the context of preparation of the relevant sections of the proposed programme budgets for 1994-1995 and subsequent bienniums as will the production of CD-ROMs for various textual information, such as treaties, terminology and resolutions.

36. A proposal to establish a technical panel on database access standards will be submitted to the ACCIS Steering Committee at its next session, at which time a budget for the project will have been formulated. A second ACCIS activity, the possibility of making the Directory of United Nations Databases and Information Services (DUNDIS) accessible on line must be costed in conjunction with the International Computer Centre management. Implementation of these activities would depend upon the overall availability of resources and relative priorities.

37. The United Nations Institute for Training and Research (UNITAR) is preparing a computer literacy curriculum that would entail financial resources. These cannot be estimated until the details of the course have been worked out. The feasibility of holding related courses would depend upon UNITAR's being able to locate adequate funding.

38. It is likely that all other action items enumerated in paragraphs 26-32, especially those that fall under the direct control of the United Nations Secretariat, could be absorbed within existing resources.

V. CONCLUSION

39. It has been possible, in the first phase of addressing the access problems that culminated in Economic and Social Council resolution 1991/70, to begin the process of providing easy, economical, uncomplicated and unhindered access to United Nations computerized databases and information systems and services. In phase two, the longer-term components, such as acquisition of the gateway computer and provision of a continuous computer literacy training programme, will require additional resources. The goal of phase two will be to fully implement the requirements stated in the Council resolution, not only for missions, but for the capitals of Member States as well.

ANNEX

United Nations Database Questionnaire

Your help in completing the following questions will assist us in analyzing and improving current data base services and allow us to prepare for your future needs. If you have questions about completing this form, please call or write to Ms. Carole Thompson.

Note: Additional sheets may be used if necessary.

PLEASE PRINT OR TYPE YOUR ANSWERS.

Please return this completed form by 13 March to:
Ms. Carole Thompson Director Electronic Services Division OGS/DAM, Room S-1912
Fax: (212) 963-0335 Phone: (212) 963-6472

1. Does the Mission use a microcomputer (PC) in its day-to-day work? ☐ Yes ☐ No

If yes, how many PCs are there? ☐ Please indicate what they are used for (check all that apply):

☐ Word Processing	☐ Database (private)	☐ Electronic Mail	☐
☐ Spread Sheets	☐ Database access	☐ Local Area Network (LAN)	☐

Are there plans to acquire PC's in 1992? ☐ Yes ☐ No In 1993? ☐ Yes ☐ No

2. How many people in your Mission use PCs? Professional: ☐ Secretarial: ☐

3. Is CD-ROM used? ☐ Yes ☐ No If no, are there plans to use CD-ROM in 1992 - 1993? ☐ Yes ☐ No

4. Does the Mission regularly receive information from:

Yes	No	
		UN Secretariat about data bases
		Other UN organizations and agencies about data bases
		ACCIS - Advisory Committee for the Co-ordination of Information Systems
		ICC - International Computing Center
Others - please specify		

5. Does your Mission now access these UN Secretariat data bases? (if "other", please specify)

	No	Yes		Computer		Ease of Use		Timeliness	
		Often	Rarely	ICC Geneva	NYCS New York	Ok	Difficult	Ok	Late
UNBIS - Bibliographic									
COMTRADE - Statistical									
UNPRESS - Press Releases									
Other									

Comments on the above:

6. Does your Mission access databases in other UN organizations and specialized agencies, such as FAO or IAEA?

☐ Yes ☐ No If yes, please indicate below:

Database Name	Organization Name	Usage		Computer Location	Ease of Use		Timeliness	
		Often	Rarely		Ok	Difficult	Ok	Late

7. Is there other UN information that the Mission would like to access by computer? ☐ Yes ☐ No

If yes, please specify:

☐ Bibliographic	☐ Text of resolutions	☐ Other (please specify)
☐ Statistical	☐ Text of treaties	
☐ Press releases	☐ Text of documents	

8. What method of computer access is used? (check all that apply)

☐ Direct Dial-Up	☐ Bitnet	☐ Euronet	☐ Internet	☐ PDN (Telenet, Telepak, etc)

Others

Has any difficulty been encountered? ☐ Yes ☐ No If yes, please explain below:

9. For those answering yes to questions 5 and/or 6 above, how is the information used? (check all that apply)

☐ Read only	☐ Other - please specify
☐ Downloading for storage	
☐ Downloading for manipulation	

10. Please comment about the ease of use and access to UN data bases.

11. Does the Mission subscribe to external on-line data services? ☐ Yes ☐ No

If yes, please indicate their names below (if "other", please specify):

☐ CompuServe	☐ Reuters	☐ CONNECT GmbH	☐ ESA-IRS
☐ NEXIS/LEXIS	☐ UPI	☐ Data -Star	☐ OTHER
☐ Prodigy	☐ Telerate	☐ Maxwell Online	
☐ Dow Jones	☐ Dialog	☐ Telesystems-Questel	

12.

Name of person completing this questionnaire	Title	Date
PLEASE PRINT		

13.

Mission	Fax Number	Phone Number

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UNITED NATIONS

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DEVELOPMENT AND INTERNATIONAL ECONOMIC COOPERATION

Cooperation in fisheries in Africa

Report of the Secretary-General

EXECUTIVE SUMMARY

The present report has been prepared pursuant to General Assembly resolution 45/184 of 21 December 1990 requesting the Secretary-General to submit, in close consultation with the Food and Agriculture Organization of the United Nations (FAO), to the Assembly at its forty-seventh session, through the Economic and Social Council, a report on cooperation in fisheries in Africa, including recommendations for its enhancement.

Fishing in Africa: A genuine economic asset to be promoted

While for years the share of Africa in world trade has continued to decline (2.5 per cent of the total value in 1965 and less than 1.5 per cent at present), Africa's fishery exports have increased threefold in constant dollars over the last 10 years, securing in 1989 a trade surplus of US$ 600 million.

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The fishery sector is therefore vital to Africa as a source of foreign exchange and protein supply, job creation and the investment potential it holds.

Meeting global challenges through cooperation

If Africa does not act now to seize the opportunities for globalizing trade and increasing world consumption of fishery products, it might well find itself marginalized and excluded from world markets.

In order to meet this major challenge, Africa must penetrate the major economic spaces of Europe and North America where the markets are not only lucrative but also protected (health and ecological standards) and demanding in terms of fiercer competition, given the rapid rise of South-East Asia and South America.

Furthermore, the speed of technological advances, the emergence of new technologies and of new products have become essential factors for securing and maintaining access to what have been termed sophisticated markets.

Finally and more specifically, international politics are having increasingly significant implications at all levels. Africa is feeling the pinch from the geopolitical dimension of this issue as bilateral and multilateral assistance is redeployed wholesale towards the countries of Eastern Europe.

Africa will be able to meet these technological, economic and political challenges only within a framework of joint and comprehensive decision-making and action. For that reason, cooperation must be pursued among African States (at the subregional and regional levels) and at the international level.

Specific needs for cooperation in the fishery sector

The United Nations Convention on the Law of the Sea stipulated what should be considered as at 1982 as national exclusive economic zones. With that came the need for cooperation in managing fishery stocks because most African countries do not have high-sea fishing fleets and the stocks happen to be shared, in most cases, among several exclusive economic zones. Joint action needs to be taken both with regard to the negotiation of fishing agreements and to the conduct of research to evaluate and to monitor shared stocks. The similarity of training needs, regulations, administration and control of fisheries provides reason to think that member States might do well to cooperate and achieve a synergy in their operations.

Africa must also conduct comprehensive research into fish culture both because of its increasing competitiveness worldwide with regard to such African fishery products as shrimps and because of the role it can play as a source of protein and foreign exchange earnings. For the latter reason, an analysis should be conducted into the widespread failure of fish culture in Africa over the past 30 years. The findings of this exercise should lead to

new policy orientations and better circulation of information so as to avoid repeating past mistakes and to promote the replication of successes.

The fishery and fish culture sector, given the mobility of fishery stocks and the renewability of stocks, albeit fragile, as well as the similarity of problems they pose to various African countries, particularly lends itself to the development of appropriate and effective cooperation.

Modalities and partnerships for effective cooperation

As earlier mentioned, the sectors of cooperation that deserve focus are research, administration, training, technology monitoring, fishing agreements and marketing, not to mention the political dimension necessary for effective cooperation.

The modalities may vary widely, but for fishing agreements the solution may be joint ventures, fishing rights in kind or foreign exchange, and the like. Similarly, the entire sector may benefit from such initiatives as the subregional maritime databases being developed by the Economic Commission for Africa (ECA), FAO and the Office of Ocean Affairs and the Law of the Sea in the African States of the Atlantic Ocean.

Care must be taken in selecting partners so that all parties benefit from cooperation arrangements whether among African States or with the countries of the North. The objectives and needs of all States should be clearly defined.

The role of international organizations

The role of international organizations in such decisions and policy-making activities is of crucial importance.

In this vein, complementarity between such organizations as ECA and FAO would be important in developing effective cooperation in Africa. With its knowledge of the field, technology and involvement in current projects, FAO could provide the inputs needed for the analysis and build the structures required for practical implementation. The mandate of ECA comes at the level of comprehensive forward planning and strategic thinking. As coordinator, it must orchestrate discussions at various levels and bring a multidisciplinary and objective approach to the formulation of strategies for developing such cooperation, taking into account the technical, socio-economic and political considerations. It is within this role of an external monitoring and coordinating agency that ECA and FAO should exercise their joint responsibility.

The foregoing should lead, after in-depth analysis, to the proposal of recommendations for improving and speeding up the institution of effective fishery cooperation in Africa.

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I. INTRODUCTION

1. Africa 1/ as a whole has considerable fishery resources, which, although not evenly distributed, could make a greater contribution to the region's food supply and general economic well-being than they do at present. Fish is an important source of food for the majority of Africans, representing over half of the region's animal protein consumption. If properly managed, therefore, fisheries could maintain or even increase their contribution to food and foreign exchange supplies through the expansion of both marine and inland fisheries and the development of aquaculture.

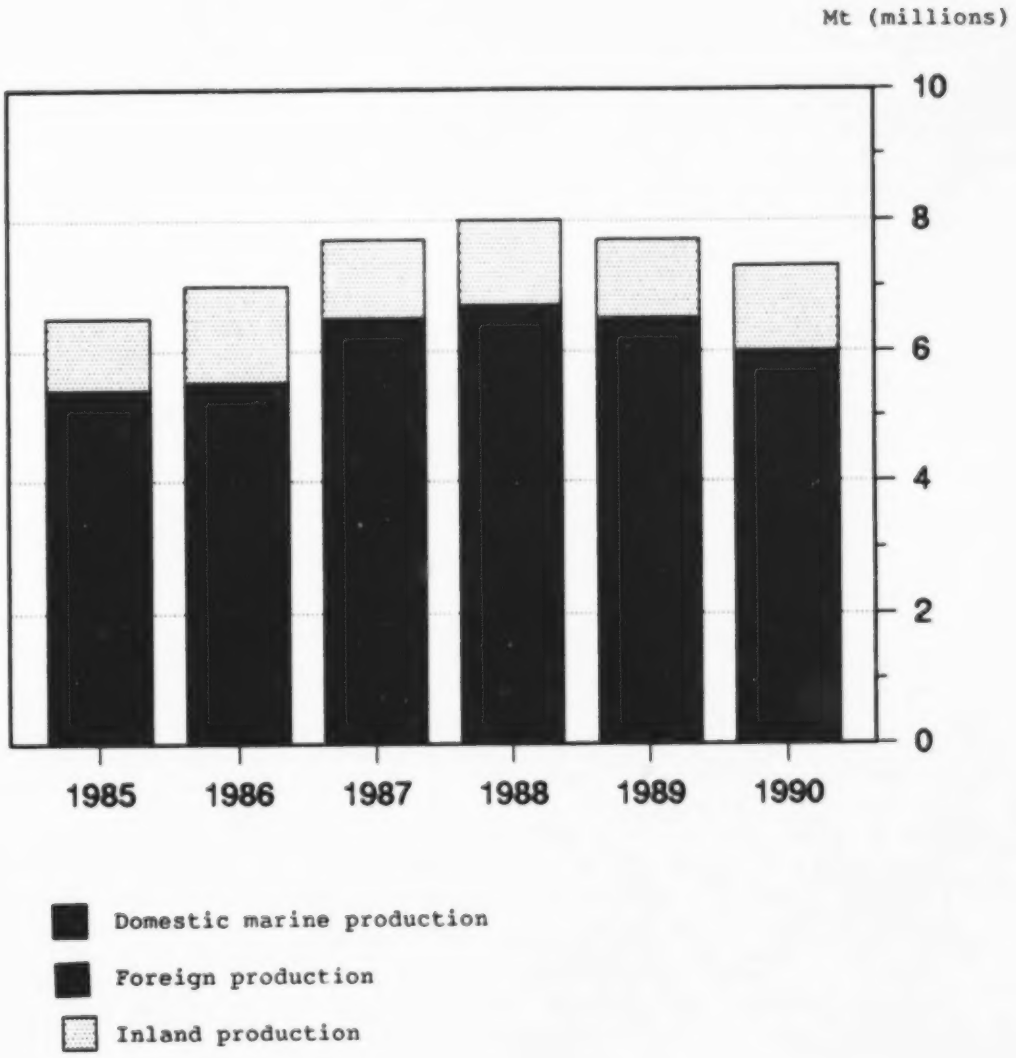
2. The United Nations Convention on the Law of the Sea of 1982 provides a framework for sustainable use of fishery resources. The exploitation of inland fisheries, and of almost all marine fish stocks that are of economic importance since the extension of national jurisdiction up to 200 nautical miles, is the primary responsibility of concerned States. Under this new system, cooperation is given an important role both for ensuring the protection of the resource against excessive fishing as well as optimal exploitation of commercial stocks on an economic basis.

3. The World Conference on Fisheries Management and Development organized by the Food and Agriculture Organization of the United Nations (FAO) in Rome from 27 June to 6 July 1984 has contributed to increasing the awareness of Governments in developing countries of the potential to be realized from the development of the fishery sector. The conference adopted a Strategy for Fisheries Management and Development, which includes, among eight major elements, economic and technical cooperation, and international cooperation. At its nineteenth session (April 1991), the FAO Committee on Fisheries "confirmed the validity of the Strategy and the member countries renewed their commitments to continue to promote their fisheries development policies and plans on the basis of the Strategy". 2/

4. Most African coastal States have adapted their fishery laws and policies to take into account the opportunities and requirements created by the new law of the sea. However, one decade after the signature of the Convention, the structure of the fishery sectors in Africa has not markedly evolved. Trends show a discreet growth in production (see figure), but, coupled with biological overfishing for major commercial fisheries, there is a danger to the sustainability of the resource base.

5. In this context, cooperation in fisheries, which focused in the past on developing production, should today address simultaneously biological, economic and social issues to permit African operators and Governments to obtain higher economic benefits from the exploitation of their fishery resources. The need for international, regional and subregional cooperation has recently increased because of the dangers of over-exploitation, but also as a result of a growing understanding of the complexity of fishery and environmental problems, as well as the unbalanced distribution of expertise, experience and technical and financial resources.

Figure. Trends in fish production in Africa



6. Efforts to estimate the economic and social impact, that is, to quantify the existing and potential contribution of fisheries to African GNP, are still at a rudimentary stage. There is a dearth of statistical data on value added that derives from fishery-related activities and products. It is clear, however, that the overall economic role of the fisheries within the African economy is steadily increasing, particularly when compared to other food production sectors. Key parameters indicate increasing primary production and exports, but declining consumer supply as a result of a reduction in imports, that is, economic trends have difficulty in keeping pace with African demographic growth and the related increase in the demand for fish and fishery products.

7. The present report prepared in close cooperation with the Food and Agriculture Organization of the United Nations (FAO) deals primarily with economic and technical trends and development of cooperation in the African fishery sector. It gives an overview of the existing situation as regards fisheries in Africa, presents observations on the directions African fisheries appear to be taking, emphasizes the role cooperation could play in addressing current challenges, and identifies a general pattern for short- and medium-term development opportunities and activities.

II. OVERVIEW OF AFRICAN FISHERY DEVELOPMENT

8. The fishery sector should be considered an integrated structure from production to consumption in which each element of the network has a close interdependent relationship with the other elements. Fishery management and development involve complex tasks requiring multidisciplinary expertise and information on a range of subject-matters, including fishery resource assessment, bio-economic and socio-economic analysis and management techniques.

9. Sustained international and regional collaboration is required for enhancing overall fishery management and consequently an accelerated development of the sector.

A. Production

10. The estimate of total potential from African waters, both marine and inland, amounts to about 9 million tons per year, of which 6.8 million tons come from marine fisheries. Western Africa (from Morocco to Namibia) account for nearly 74 per cent.

11. Total production shows a feeble increase over the last two decades. Overall total fish production from all African waters, domestic and foreign fleets combined, rose from 6.4 million tons in 1970 to 6.5 million tons in 1985 and 7.3 million tons in 1990, of which about 78 per cent was produced from marine waters (table 1).

Table 1 : Fish production in Africa (metric Tons)

		1986	1988	1987	1988	1989	1990
WEST AFRICA	Angola	66497	49436	74936	93753	103132	98941
	Benin	6371	8753	9916	6668	8962	8863
	Cameroon	65955	63960	62529	62529	57644	57644
	Cape Verde	10190	6386	6831	6098	8620	7016
	Cote d'Ivoire	77782	75436	74253	60936	68604	78755
	Eq. Guinea	3200	3950	3600	3600	3600	3600
	Gabon	19200	18980	20385	20680	21000	20000
	Gambia	6012	6873	10430	4268	3963	6688
	Ghana	233049	266523	327020	304374	304075	333766
	Guinea	28000	29500	31000	31000	31000	29500
	Guinea bissau	3600	3620	4000	4540	5200	5200
	Liberia	7478	12063	14731	12074	13000	12500
	Mauritania	97300	92200	93400	91600	88612	85000
	Morocco	436774	556387	462788	521288	487818	530878
	Namibia	13000	14000	31486	32416	20097	289751
	Nigeria	154252	161515	155589	168281	184733	217652
	Sao Tome Pri	3668	2833	2788	2800	3116	3583
	Senegal	231008	240668	239868	243728	271200	282652
	Sierra Leone	37011	37313	37206	37273	37190	36000
	Saint Helena	572	632	741	788	1013	806
	Togo	14844	14124	14476	14766	16044	15378
	Zaire	1800	2000	2000	2000	2000	2000
	South Africa	771349	815821	1421173	1298628	874042	532487
TOTAL WEST AFRICA		2307688	2500877	3108868	3048082	2834270	2877431
EAST AFRICA							
	Comoros	5200	5250	5250	5500	6750	8000
	Djibouti	380	408	428	464	381	400
	Ethiopia	500	600	500	723	1567	2000
	Kenya	6188	6212	6878	7870	7810	7886
	Madagascar	36068	44347	52428	61088	68380	74740
	Mauritius	12321	12868	18138	17088	17137	14607
	Mozambique	33308	31184	36860	33300	33078	34720
	Reunion	2188	1724	1778	2080	1888	1952
	Seychelles	4080	4842	3963	4343	4403	5368
	Somalia	16487	16500	17000	17700	17700	17100
	Tanzania	42740	44086	39806	48198	48686	47000
	South Africa	3247	2901	2480	2417	2238	1613
	Sudan	408	1180	1200	1200	1200	1127
TOTAL EAST AFRICA		182107	171758	186878	203081	213008	216513
AFRICA MARINE TOTAL		2489776	2672646	3294646	3249163	2947278	2893944
FOREIGN FLEETS							
	West Africa	2638833	2701814	2945233	3170812	3407114	2942898
	East Africa	247982	289989	321170	372585	320628	316377
Total foreign fleets		2886815	2991803	3266403	3543397	3727742	3259275
SUBTOTAL AFRICA (marine)		5376591	5664449	6560948	6792560	6675018	6153219
INLAND PRODUCTION		1164769	1238481	1221838	1285122	1307298	1149950
GRAND TOTAL AFRICA							
(marine domestic + inland)		3654545	3912127	4516383	4534288	4154582	4043894
(mar. dom. + foreign + inland)		6521480	6903930	7782786	8077682	7982304	7303169
% of foreign production		53.9	52.8	49.8	52.2	58.7	53.0
% of foreign production (marine + inland)		44.3	43.3	42.0	43.9	47.3	44.6

12. Since 1985 a small but steady increase has taken place with domestic production rising to 4.5 million tons in 1988, of which marine domestic production accounted for 3 million tons. Since 1988, however, total marine production (domestic and foreign fleets combined) has declined from 6.8 million tons to 6.1 million tons in 1990.

13. Substantial differences are found in the volume of domestic landings between subregions. The land-locked countries account for only 17 per cent of total domestic production, while western African countries contribute 45 per cent.

14. Average catches from foreign fleets were around 3 million tons per year, or about 53 per cent of total marine catches in 1986. Their share increased to 57 per cent in 1989 but in 1990 it dropped by 500,000 tons to return to the percentage share of 1986.

15. Comparison of potential with current catches suggests that, globally, marine resources are fully exploited and that the maximum economic yield has been reached for most of the major target species.

16. On the contrary, inland fisheries could thecretically withstand an important increase in production. Reservoirs and natural lakes provide the most productive fisheries. However, in general, the most accessible freshwater resources are heavily exploited; those in remote areas will require important efforts to bring them into fuller production, together with substantial improvements in resources and socio-economic information, provision of infrastructure and management support. In some cases, production levels can be more easily raised from better utilization of small water bodies, mainly small multiple-purpose reservoirs.

B. Trade

17. The strongly increasing demand for fish, regionally and worldwide, can be considered one of the most significant issues in a scenario for the future.

18. Despite the abundance of resources in Africa, many countries have to rely, sometimes heavily, on imports to supplement domestic production. Whereas the fish trade balance in quantity has shown a continuous deficit since 1975, there is a different pattern with regard to the value of trade.

19. Africa has become a net fish exporter since the mid-1980s in terms of value. While total African export and total agricultural export values have declined from US$ 122,065 million and $14,203 million in 1980 to $81,534 million and $12,237 million respectively in 1989, value of total fish exports has increased almost threefold, from $545 million to $1,554 million during the same period. Considering Africa as a whole, the agriculture sector has been a net importer, while the fishery sector has been a net foreign currency earner with a trade surplus reaching over $600 million in 1989. Crustaceans contribute about 50 per cent of the total export value of fishery products.

20. However, Africa remains a net fish importer in terms of quantity. Major importing countries are Nigeria, Côte d'Ivoire, Zaire, Angola and Cameroon, accounting for 59 per cent of total African fish import. Seventy per cent of fish imported by African countries consist of low-value frozen fish. In recent years, total import value has declined, while import quantity remains stagnant at about 1.2 million tons. This is a reflection of implementation of structural adjustment policies and general shortage of foreign currencies.

C. Consumption and utilization

21. Despite some growth in production, average per capita supply in Africa is decreasing from 11.7 kg/y in 1973 to 9.7 kg/y in 1982 and 7.9 kg/y in 1989, while the 1984-1986 average total world supply was 12.4 kg/y, and the average supply of developed countries was 25.3 kg/y. Hence, total African supply has not kept pace with population growth of about 3 per cent per annum. Of the two most populated regions of Africa, west Africa has suffered a severe decline of 21 per cent, while a modest increase of 0.9 kg/y was recorded for east Africa. It is noteworthy that countries like the Congo have a per capita consumption of 34 kg/y (see table 2).

22. This would appear to be an alarming development in a continent where fish products often represent the single most important source of animal protein in the human diet (see table 2). The general economic situation in Africa and prospects for the medium-term suggest that imports will continue to be constrained while, as population increases, demand will continue to rise. To maintain current average per capita supply, say in the year 2000, Africa will have to produce or import an additional 50,000 tons each year.

23. Post-harvest wastage is still substantial, estimated at around 10 per cent of African domestic production, excluding discards at sea by the industrial fleets. However, the great difference in value between target species and discarded species makes profitability of by-catch salvage a major obstacle. A regional programme on improving post-harvest utilization of artisanal fish production, supported by the European Economic Community (EEC), is being initiated in west Africa. Similar activities may be necessary in the eastern/central region.

D. Capture fisheries

24. In general, both marine and inland fishery resources are under severe pressure almost everywhere in Africa. Most of the marine bottom fish resources are overfished or fully exploited. Drought in the northern African areas in the 1980s and more recently in the southern areas plays an important role in resource availability both for inland waters and for coastal systems. The latter are affected by lowered inputs of nutrients from land with lowered inflows, while the former are affected by loss of space.

TABLE 2 : FISH SUPPLY AND PROTEIN INTAKE

COUNTRY	FISH SUPPLY (MT)			FISH SUPPLY PER CAPUT			FISH IN TOTAL PROTEIN (%)			FISH IN ANIMAL PROTEIN(%)		
	1980	1985	1989	1980	1985	1989	1980	1985	1989	1980	1985	1989
ANGOLA	66386	214428	327980	8.5	24.5	23.4	6.1	18.1	18.7	28.9	41.2	46.1
BENIN	48039	48672	48084	13.0	11.5	10.3	7.5	6.4	5.2	37.8	36.5	28.6
BOTSWANA	3084	3097	3749	3.4	2.8	3.0	1.8	1.3	1.3	4.8	4.2	4.8
BURKINA FASO	8785	11947	19846	1.4	1.5	2.2	0.7	0.8	1.0	8.7	8.8	8.7
BURUNDI	13832	11884	11915	3.8	2.5	2.2	1.0	1.2	1.3	25.7	20.2	23.3
CAMEROON	114186	143315	153814	13.2	14.3	13.4	6.8	7.8	6.5	31.9	32.8	30.8
CAPE VERDE	6888	6377	4188	22.8	25.8	11.7	10.1	12.2	6.1	44.2	51.1	25.0
CENTAFRREP	13834	14107	14286	5.9	5.3	4.8	4.0	3.8	2.8	15.8	12.4	10.7
CHAD	60488	68887	84842	16.0	17.1	17.1	9.4	9.0	8.8	37.0	35.8	36.8
COMOROS	4300	5318	6031	10.7	11.5	11.4	8.1	8.4	8.8	42.1	48.4	48.3
CONGO	47188	78418	79010	26.3	40.4	34.1	22.0	28.8	24.4	56.1	61.4	56.2
COTE D'IVOIRE	148138	172843	173033	16.1	17.3	15.0	8.8	8.5	8.4	36.8	36.7	36.7
DJIBOUTI	291	1444	918	0.8	4.1	2.3	0.0	0.0	0.0	1.3	7.7	4.8
EQ GUINEA	4408	5388	6781	20.3	17.2	18.7	0.0	0.0	0.0	60.8	67.2	73.8
ETHIOPIA	3618	4130	5488	0.1	0.1	0.1	0.2	0.2	0.0	0.3	0.3	0.4
GABON	32715	34888	32438	40.8	35.1	26.8	18.2	15.4	14.0	34.8	28.1	29.1
GAMBIA	8715	11288	11800	10.5	18.1	14.2	8.7	8.8	8.9	32.0	35.8	40.2
GHANA	238838	272884	373084	22.3	21.2	26.8	17.8	18.7	18.0	58.0	57.2	62.8
GUIN BISSAU	3887	3888	2124	4.8	4.4	2.2	3.1	2.8	1.1	18.2	13.8	7.8
GUINEA	30787	38848	48038	6.8	7.7	8.2	4.2	4.8	4.8	30.1	30.2	33.8
KENYA	47877	108104	133110	2.8	5.2	5.7	1.4	2.7	3.1	8.7	8.8	8.8
LESOTHO	2434	2172	2848	1.8	2.1	1.5	0.8	1.0	0.8	3.2	3.4	6.1
LIBERIA	28887	28788	33838	14.2	13.8	13.4	8.4	8.1	8.8	32.2	31.3	41.2
MADAGASCAR	81353	83881	81800	5.8	8.2	7.8	3.0	3.8	4.7	12.8	13.8	18.2
MALAWI	38843	82284	80848	8.8	8.8	10.8	4.4	4.0	5.3	48.7	48.4	52.3
MALI	81843	53848	71843	11.8	8.7	8.0	8.3	3.4	3.7	23.0	18.8	18.1
MAURITIUS	15878	14818	18848	18.8	14.2	18.3	8.8	7.8	8.2	28.3	24.2	28.0
MOZAMBIQUE	48088	42118	44788	3.8	3.1	2.8	4.1	3.3	3.1	38.2	38.8	23.8
NAMBIA	10880	13100	18887	7.8	8.8	8.1	3.4	3.8	3.7	8.0	8.0	10.8
NIGER	8888	2730	5888	1.7	0.4	0.7	0.8	0.3	0.3	4.8	2.1	2.7
NIGERIA	888880	811888	834888	12.7	8.8	8.1	8.8	2.8	2.7	28.8	23.8	24.0
REUNION	13088	18811	140084	28.7	28.3	24.0	10.3	8.8	8.8	23.2	20.1	18.8
RWANDA	1038	808	1408	0.4	0.1	0.2	0.2	0.2	0.2	2.8	1.0	1.7
SAO TOME	1847	4888	3488	18.8	43.0	28.4	10.7	24.2	17.4	80.2	78.2	82.8
SENEGAL	138848	141888	188884	28.8	28.2	21.5	8.8	8.4	10.1	41.8	38.1	38.7
SEYCHELLES	3887	3878	3088	68.4	50.4	44.8	31.1	24.8	22.1	81.3	48.1	43.7
SIERRA LEONE	74738	81848	84888	28.8	18.8	13.8	18.5	13.8	11.7	88.7	87.8	88.8
SOMALIA	12888	13888	18811	2.3	2.4	2.3	1.3	1.3	1.2	2.1	2.3	2.3
SOUTH AFRICA	281418	312147	348888	8.8	8.8	10.1	3.8	3.8	3.8	8.8	8.8	11.2
SUDAN	28818	27320	23088	1.4	1.2	0.8	0.8	0.8	0.5	1.8	1.8	1.4
SWAZILAND	70	80	118	0.1	0.1	0.2	0.2	0.2	0.0	0.2	0.2	0.2
TANZANIA	288718	3774	38887	13.1	13.2	14.7	6.5	6.7	7.7	33.1	34.2	38.8
TOGO	38488	37884	88384	11.3	12.5	18.3	7.0	7.8	8.8	48.3	48.1	48.8
UGANDA	188840	180800	247300	12.8	10.3	13.7	7.8	8.8	8.8	38.2	33.1	42.7
ZAIRE	178081	388888	387320	7.0	10.7	8.3	8.8	8.1	7.8	37.3	48.1	42.7
ZAMBIA	88888	748	8180	2.2	10.8	8.1	3.0	8.2	4.2	28.3	38.4	28.7
ZIMBABWE	18888	17888	18888	3.4	2.1	1.7	1.4	1.1	8.8	8.3	7.8	8.7
AFRICA TOTAL	3410381	3888887	4038887	8.88	7.88	7.80						

25. Although quantitative nformation is incomplete, the fishery sector, being labour-intensive, provides an important source of employment across Africa. The number of fishermen is estimated at over 1.8 million. Less than 2 per cent of full-time fishermen are engaged in industrial fishing. A precise figure for employment generated by the secondary sector (processing, transport and marketing) is not available, but is estimated to be in the range of 8 million. Hence, total employment in African fisheries may be close to 10 million, or about 9 per cent of the total recorded labour force in agriculture.

26. During the past 10 years, the major part of the increase in domestic production was contributed by an increase in national industrial production in west Africa. It is foreseen, however, that the economic performance of industrial vessels will fall unless appropriate management measures are introduced and enforced.

27. In some countries, mechanized canoe fisheries are competing successfully with industrial boats, while in other countries or areas the canoe fishery is declining as a consequence of difficulties in obtaining the necessary fishing inputs and capital, compounded by the general trend of economic difficulties and of increasing displacement by industrial fishing operations. Because of the overfishing taking place, with the related falling catch rate, industrial vessels tend to operate closer to the shore, leading to progressive encroachment on the shallow waters by the small-scale fishermen. Eventually, such a development, if not properly analysed and addressed, would reduce earnings and employment in the artisanal sector and consequently the supply of fish for domestic consumption in the countries concerned. For example, the contribution of the artisanal sector to domestic marine production in the region of the FAO Fishery Committee for the Eastern Central Atlantic (CECAF) has declined from 59 per cent during the period 1975-1979 to 46 per cent in 1985-1989, according to available data (from Morocco to Zaire).

28. From a social and economic point of view, small-scale fisheries in the region are, in general, the most economically valuable fisheries; they are highly efficient in terms of the quantity of fish produced per unit of energy input and per unit of capital invested. Furthermore, with regard to the selectivity of their harvesting methods, most artisanal fisheries can be considered ecologically beneficial while producing quality food for direct human consumption at prices affordable by lower-income consumers.

29. In real terms, average operators' revenues, particularly those dependent on the small-scale sector, are not increasing enough to allow substantial indigenous investment in the sector. Greater emphasis should also be put on increasing the economic productivity of the individual fishermen, notably by promoting the allocation of territorial use rights.

30. Experience with industrial fisheries in Africa has been varied. In general, indigenous industrial offshore fishing has not progressed in recent years. Cost/price pressure, together in some cases with difficulties in access to foreign exchange, have contributed to the poor economic performance

of the local fleets. However, the profitability of industrial fleets appears to differ markedly from one country to another, those of Morocco and Nigeria being successful examples.

31. In view of decreased catch per unit of effort and despite increased export prices, there has been a decrease in financial productivity of shrimp and other high-value demersal fleets in west Africa leading to a stabilization of investments. As a result the domestic fleet in west Africa is old, often with an average age of 20 years. This situation has been partly compensated by higher performances in eastern Africa.

32. Tuna operations are still dominated by Asian and European interests, although African investors are increasing, for example, in Ghana, Senegal and Côte d'Ivoire. As prices of main tuna species are stabilizing with operation costs generally increasing, further investments in both coastal and long-distant fleets are likely to diminish. Embarking upon the sort of operation spearheaded by the East European fleets for low-value small pelagic species, using large trawlers, is equally questionable in the short term unless prices for those species increase substantially.

33. Foreign fleets, though their share is slowly decreasing, still take about half of the marine catches, concentrating either on small and large pelagic species or high-value bottom fish. Their landings have reportedly decreased from over 4 million tons in the mid-1970s to less than 3 million tons in 1986, but fluctuating greatly thereafter.

34. However, these figures have to be tempered in economic terms when considering the increasing volume of foreign exchange generated through licensing foreign vessels and compensations obtained from intergovernmental fishery access agreements. Options still need to be devised case by case and at subregional level to identify strategies for generating the maximum social and economic benefits from offshore fisheries (development of local industrial fleets, joint ventures, access agreements, licensing arrangements, etc.).

35. In the Indian Ocean, with the exception of the five agreements currently in force with EEC, mainly for tuna, only two agreements have recently been concluded with the Asiatic countries and one between neighbouring countries of the subregion. The general trend is, however, towards a reduction of the level of fishing effort authorized and an increase of financial and other compensations.

36. In the Atlantic Ocean, fishing agreements between coastal countries have developed considerably. Most of the agreements provide for reciprocal access rights between neighbouring countries. Agreements in which one of the parties has a developed industrial fleet, but for which abundant resources are lacking (e.g. Nigeria and Ghana), tend to include compensatory fees and specific provisions for regulating fishing effort (number of vessels authorized, etc.). The number of agreements concluded with foreign fleet States is steadily decreasing, but their financial and material importance for the coastal States concerned is increasing notably. This stems from the fact that

agreements with EEC member countries are presently concluded by the Community (14 agreements are currently in force in west Africa) and that agreements with East European countries are not renewed automatically.

37. Global trends in the industrial sector will remain in the foreseeable future, public versus private, foreign versus national fleets, sale of fishing rights versus joint ventures. There are, however, so many scenarios in which industrial fisheries operate that it is difficult to generalize. The path for a faster rate of development lies in appropriate national and subregional policies, institutions and expertise.

E. Aquaculture

38. There are abundant physical resources in many parts of Africa for fish farming. Pond aquaculture has not been widely successful in Africa and it has been disappointing for creating new employment opportunities or increased national food supplies. Considerable efforts have already been devoted to aquaculture research, education, training and extension. Although development aid directed to fish farming has totalled over $100 million during the last 10 years, aquaculture production remains extremely low and, at about 30,000 tons per year, it represents less than 1 per cent of total domestic production. Nigeria, Zambia and Zimbabwe are the major producers. African aquaculture is characterized by small-scale rural subsistence activities rather than intensive commercial operations.

39. Commercial shrimp culture has not been developed successfully, although short-term prospects appear very positive in countries such as Madagascar. More realistic possibilities for aquaculture-like development rest with indigenous African production or enhanced practices (such as acadja brush parks) and through carefully selected introduction and stocking of species as well as micro-fisheries in small freshwater bodies and reservoirs.

40. It is apparent, therefore, that a comprehensive analysis is required to identify the constraints to aquaculture development within the context of the whole crop-livestock-fish production system, in particular the conflicting demands on labour, capital and land, marketing outlets and incentives for entrepreneurial fish-farming activities when demonstrated economically profitable. In particular, entrepreneurial and rent-seeking behaviours need support, and opportunities for development should be carefully examined. Such a review to recommend new approaches to aquaculture development in Africa is being initiated jointly by the Economic Commission for Africa (ECA) and FAO.

III. STATUS AND PROSPECTS FOR COOPERATION

41. Significant progress has been made in some African countries towards increasing production and developing self-sustained national capabilities.

42. The challenge for achieving optimal economic benefit from the exploitation of African fishery resources requires enhanced fishery

cooperation. This stems from the nature of the main constraints the sector is facing, which are, firstly, structural (bio-economic sustainability of fishing operations, necessity to develop research and training, and similarity of national fishery administration needs, particularly in development planning and resource management) and, secondly, contingent to the specific circumstances (acquisition of new technologies, market organization, revision of aquaculture policies and common concern for funding).

A. Major challenges

1. International markets and local food supply

43. Trade of fish and fishery products is currently characterized by an important increase in world trade. Globally, this impressive growth is marked by an increased demand in Europe, North America and Japan. It is believed that this growth will continue. For example, with the opening of the Eastern countries, Europe may constitute in the foreseeable future a market of 770 million people, for which demand for fishery products has been evaluated at about 20 million tons per year (or 20 per cent of world production). This market will be dominated by the supply/offer rules and competition will be tight. This requires that public and private fishery actors adapt continuously to the exigencies of the internationalized markets rapidly evolving in terms of new products and higher quality standards.

44. The emergence of biotechnologies and aquaculture industries will lead to important structural changes. New products such as cultural shrimp already affect important shrimp capture fisheries, some of which are economically essential in Africa, for example, in Magadascar.

45. The efforts for maintaining African fish exports in the very evolutive international market might be further hampered by the local challenge for food being faced by the continent, bearing in mind the 30 per cent decrease of total fish supply for human consumption over the period 1980-1989.

2. Increasing social and economic benefits from the exploitation of the exclusive economic zones

46. The full utilization of the fish stocks of the African exclusive economic zones by domestic vessels remains a major policy objective of many African coastal States, although lack of finance, trained personnel and relevant technology, as well as increasing operating costs, are serious constraints to the achievement of this goal.

47. The difficulty most African coastal countries have faced in industrial fishing operations in recent years indicates the complexity of this task in the future. Industrial fisheries is a capital-intensive and high-risk sector where unknowns, such as the variability and vulnerability of stocks, are further complicated by the difficulties of establishing international

markets. Further, the wide range of multidisciplinary skills necessary to promote African industrial fishing are still dramatically insufficient at country level, with few exceptions.

48. During the 1980s the development of national capabilities has been particularly impressive in some north-west African countries such as Morocco and in some south-west Indian Ocean countries such as Madagascar. These examples provide an indication of the ways in which development might take place over the medium to long term. Most notably, some significant trends can be quoted: the requirement that industrial joint venture fleets land all or part of their catches at ports of the State(s) of the exclusive economic zone in which they are fishing (as in the case of Mauritania or Seychelles) gives the coastal State a larger share of the revenues earned, including value added and employment; and technological development of the small-scale subsector is taking place in Senegal, Ghana or through the expansion of the Nigerian or Guinean inshore trawler fleet.

49. For some countries, other options remain for the medium term in well conceived licensing, joint venture and other arrangements that can ensure considerable economic benefit if properly planned and managed. Foreign exchange earned could, in turn, be reinvested in building up national infrastructures and capabilities. In the short to medium term, the restructuring of the Eastern European fleets could favour joint venture arrangements with more foreign vessels based in African coastal ports.

50. However, progress already achieved by some countries shows that a higher participation of African entrepreneurs in exploiting offshore fishery resources still requires the full political and financial commitments of the countries concerned and more coordination at a subregional level in areas such as resource management, harbour development, access right policy, and so on, and the support of the international community.

51. As a contribution to a better assessment of the strategies for achieving the objective of increasing participation of African entrepreneurs in the exploitation of their fishery resources, in-depth studies on the opportunities and constraints facing the industrial fishery sector in west Africa have been initiated by FAO. Topics covered so far include the financing of industrial fisheries, financial analysis of local vessel operations, the role of subsidies in industrial fisheries and the economic return of fishing agreements.

52. There is still a need further to sustain and complete these preliminary initiatives, particularly in incorporating studies on the economics of foreign fleet operations off African countries, including comparative analysis of government support (e.g., subsidies and financial bonuses) in developed countries, economics of joint venture arrangements, and so on. Preliminary results have indeed demonstrated that such a comprehensive study may require cooperative support as a major programme encompassing the various disciplines involved with the management of industrial fishing.

3. Securing necessary funding for fishery development

53. If the fisheries sector is to have a major impact on the supply of animal protein and to the African economy, major policy changes are required giving the sector a higher priority. For countries that cannot afford additional financial commitments, a better use of existing cooperation mechanisms can substantially promote economy of scale and reduce the necessary effort required to develop their fisheries.

54. The fishery sector in Africa has received, in current value, an average of $200 million per year in technical assistance over the last decade. While assistance approached $230 million in 1985, recent trends show a decline to $147 million in 1989 (see table 3). Activities such as institutional support, research, training and sector and feasibility studies have attracted substantially lower commitments than the supply of "hardware".

Table 3. Trends in external assistance to African fisheries

	1985	1986	1987	1988	1989	1991
Total external assistance a/	227 964	114 795	222 666	169 928	146 465	NA
Total number of projects	137	126	1 175	183	172	NA
Technical assistance a/	25 294	16 967	41 292	50 750	51 600	NA
Number of projects	65	71	88	84	72	NA
Regional projects a/	3 124	1 444	20 765	11 312	9 928	9 197
Number of projects	4	9	16	14	13	14

Source: Fishery Project Information System (FIPIS), FAO.

a/ Thousands of United States dollars.

55. The reluctance of some donor agencies to invest in African fisheries stems from the perception that it is a complex economic sector and that fishery projects are especially difficult to administer. This has resulted in limitation of the fishery portfolio, a policy stance that is of great concern to African countries possessing surplus stocks. This apparent decrease in funding, however, did not extend to the level of donor activity, the number of

projects remaining much the same (see table 3). Most regional and national projects were in the past financed by the major multilateral donor agencies, including the development banks; the majority are now financed through bilateral sources.

56. Financing of regional projects are indicative of trends in regional cooperation in fisheries. Average expenditure for regional assistance projects in Africa was in the range of $20 million per year in 1987 and decreased to about $10 million in 1991. This compares unfavourably with the above-mentioned $150 million directed to national projects. To reverse this negative trend affecting regional cooperation, there is an urgent need for countries in the region to allocate part of their national assistance funds, in particular United Nations Development Programme (UNDP) national indicative programme figures, to regional projects.

57. The value of delivering technical assistance through regional arrangements has been demonstrated, in particular the benefits that can be derived by subregional technical support projects associated with regional fishery commissions or their subsidiary bodies. Apart from economy of scale, regional projects also help in avoiding situations where project management has fully occupied fishery administrations, thereby affecting the carrying out of ongoing governmental functions.

58. The regional approach is imperative for all activities, such as the compilation and dissemination of fishery statistics, resource evaluation, fishery management, training and so on, which need to encompass stocks, socio-economic activities and ecosystems in their totality.

B. Short- and medium-term cooperation needs

1. Resource management

59. Overfishing and depletion of African stocks by both domestic and foreign fishermen has brought the issue of resource management to the forefront. Most African marine and inland water stocks are under severe fishing pressure. Only in a relatively few cases will additional fishing efforts result in an increase in catches over the longer term. There are still some fish stocks that are underutilized, but their exploitation cannot compensate adequately for overexploitation of other stocks. In most instances, improved yields can only be achieved by direct government initiatives in the sector and improved regional cooperation in the management of shared stocks.

60. Examples of shared stocks are numerous around the African continent, especially off the north and south-west subtropical sectors where fish resources are abundant, as well as in many international lakes and large rivers such as in the Sahelian region or the Rift Valley area.

61. Obtaining accurate information on the state and potential of fish stocks, a persistent problem, is very necessary for both sound investment planning and

rational resource management. However, acquiring this information is costly and requires skilled personnel for data collection and interpretation. Most African countries have great difficulty in meeting this demand for human and material resources on a continuing basis.

(a) Research

62. Fishery research is evolving rapidly in a context of increasing international competition. Some countries may have particular reasons to strengthen their collaboration in fishery research because their resources belong to the same ecosystem and the development of research capabilities meets similar problems. They often share stocks that cannot be effectively managed without active regional cooperation.

63. A study on international fishery research needs, including an assessment of the requirements for west Africa, was carried out at the initiative of the first fishery development donors consultation, held in Paris in 1986. The consultation was concerned that many development projects providing infrastructure for fisheries had not been successful and questioned whether lack of research was a contributing factor.

64. The study showed that research capabilities vary widely among countries, reflecting the differences in the significance of the fishery sector, the size of national economies and government development priorities. The highest priority need rests with the strengthening of national research capacity to conduct applied research. However, in many instances, national programmes can be combined with regional initiatives. Similarities occur in the patterns of achievements and shortcomings in almost all countries, indicating common difficulties in the uses of research outputs for sectoral development. As a result, the fishery management options are generally not identified and quantified, nor are fishery management plans formulated. The study concluded that the major weakness was a lack of cooperation in research activities.

65. Few countries in Africa have the necessary technical capacity and financial resources to undertake, on their own, fishery research campaigns, including exploratory fishing and monitoring of stocks. Cooperative use of research vessels and joint research programmes are presently encouraged by almost all west African fishery bodies. There are also similar possibilities to be developed along the east African coast.

66. Generally the main constraints are inadequate levels of funding and salaries, training (particularly for fishery management), integration of research at regional level, and demand for and utilization of research by administrations and the private sector. Institutional support should be developed or strengthened at two levels: (a) applied or adaptive research to serve immediate needs of the sector; and (b) strategic or fundamental research necessary to anticipate production changes or new production techniques and modalities.

67. This will allow research to provide a direct input to management (administration) and to fishery development (production and commercialization), including aquaculture. Priority fields for research, although differing from fishery to fishery, should be reviewed to incorporate, in addition to the biological aspects of the fishery resources, the policy, economic and social dimensions.

68. More specifically, adequate approaches should be devised to respond to research needs as expressed at regional levels. Cooperative research efforts should have clearly identified objectives, responsibilities and deadlines, be given carefully evaluated priorities and be fully integrated with overall national fishery management and development plans. These are, for example, in the field of fishery management: the setting up of fishery databases; and the utilization of geographical information systems and digitized fishery charts; in the field of fishery planning: profitability of fishing ventures; and internal and international market analysis; for aquaculture: studies on new production systems; and in-depth socio-economic analysis of operations under various conditions.

69. Bio-economic modelling is particularly critical for the better understanding and anticipation of the effects that various management options will have on the resource and on the sector as a whole. Improved research and information are also needed to deal adequately with the potential trade-offs between different users of the resources and related technologies (e.g. industrial versus small-scale fisheries).

70. Overall, a positive will is developing to strengthen regional and subregional cooperation for research. This trend needs to be further monitored and encouraged.

(b) Information and data systems

71. Statistical data (both current and historical) comprise the quantitative foundation upon which fishery policies, resource management and development programmes should be based.

72. A serious deficiency lies in the lack of social and economic data, including fish price data. Such data are essential for evaluating the health of the industry and returns to capital and labour, for resolving conflicts among users and for the formulation and implementation of fishery management measures. Collaboration at the regional level in the analysis of such data collected by national institutions should be encouraged. Recently, such an effort is being developed through FAO-executed projects linked with the newly established socio-economic database FIPPDAT, which provides specific entry and retrieval for African countries.

73. In an effort to improve fishery information in the region, FAO has also been engaged in the preparation of a directory of human and material capacities in fisheries in African States bordering the Atlantic Ocean. Plans have also been concluded for the preparation of similar directories on the

African fisheries workforce and commercial fisheries enterprises. Efforts are also being made to facilitate direct access by users to the data on computerized files of the Fishery Statistical Database (FISHDAB), which bring together major collections of statistics on fish catches, landings and trade supported by complementary databases such as FIPIS for monitoring externally assisted projects.

74. Central collection and analysis of data from all fleets fishing a common resource are essential, in particular to allow for more effective judgements about levels of fishing effort, licensing fees and so on. With regard to foreign fleets, vigorous action in the collection of statistics within the framework of fishing agreements is still necessary.

75. The standardization of national statistical systems at subregional level or for particular fisheries is being initiated, for example, for the Lake Tanganyika and Lake Victoria fisheries, and should be encouraged in other areas such as for the Sahelian fisheries. The establishment of regional maritime databases, as envisaged for the west African region, constitutes another major tool for harmonizing data. It will also permit a more effective use of the stored information capacities of the United Nations system and other agencies.

76. While there exists further potential for developing intra- and extra-regional trade, a flow of information to exporters on market opportunities, reinforced by technical assistance on exporting methods, and so on, remains a prerequisite for further development. The Regional Fish Trade Information and Cooperation Service for Africa (INFOPECHE), presently a trust fund project, will become an intergovernmental organization in 1993. INFOPECHE collaborates with similar services in other regions and with a computerized fish market indicator system (GLOBEFISH) at FAO headquarters, with field projects, banks, and other United Nations and donor agencies.

(c) Monitoring, control and surveillance of the exclusive economic zone

77. Control of foreign as well as national industrial fleets is another major concern for fishery management in Africa. The most disastrous case of stock collapse (i.e. Namibian pilchard) was due to overfishing by the large industrial fleet.

78. The primary tool for controlling fishing activities is the enactment of sound legislation. While a large majority of African States have taken advantage of the new legal regime of the sea, and most of their fishery legislation is quite recent, great efforts are still necessary in two areas. Firstly, in a number of cases the implementing regulations are incomplete or even non-existent, thus depriving the legislation of any effectiveness. The second problem faced by African States is the lack of enforcement of their legal instruments.

79. There is an increased awareness of the need for effective surveillance and compliance systems to be implemented by coastal States. Most African

countries cannot, however, afford the luxury of expensive surveillance vessels and aircraft dedicated only to fishery use. This could result, in many cases, in complete dissipation of licensing fees and other royalties derived from allowing access by foreign fleets to the exclusive economic zone. A realistic option available to Governments in the short term is the development of efficient composite systems.

80. A wide range of complementary means could be envisaged to decrease monitoring, control and surveillance costs, for example, the establishment of subregional registers of national and foreign vessels, joint use of surveillance aircraft, harmonization of access policies and procedures, use of satellite surveillance and transponders on vessels in monitoring, control and surveillance, and so on. For example, the Subregional Commission on Fisheries (SRCF) is engaged in the setting up of a training programme and harmonized status for monitoring, control and surveillance observers, as well as a joint system for the marking of fishing vessels and the adoption of a convention on the determination of conditions of access to and exploitation of the resources of exclusive economic zones. Similar activities and mechanisms are envisaged by the Ministerial Conference on Fisheries Cooperation among African States bordering the Atlantic Ocean, including the establishment of a regional register of fishing vessels and a regional maritime database (see also paras. 113-117).

81. At the request of the Ministerial Conference, a workshop to review current monitoring, control and surveillance mechanisms in West Africa and to identify cooperative actions will be organized by FAO in the region in late 1992. Similar initiatives to facilitate such activities in other African regions should also be adequately supported through the formulation of adequate subregional programmes in this area.

(d) Environment and multiple use of natural resources

82. The present situation whereby fisheries are low on the priority scale, as compared to other users of water resources, means that valuable fishery resources are being lost through pollution and environmental deterioration, particularly in coastal areas, river basins and large lakes.

83. On the west African coasts, for example, the concentration of manufacturing activity and population density are the highest in Africa. It is often in these areas that environmental degradation is the most visible and the adverse effects of environmental deterioration are often felt earlier in the fishery sector. Similar phenomena are also noted for inland aquatic ecosystems. In this context, fishery and environmental issues need to be addressed at a subregional level.

84. In this respect, a holistic approach to information gathering and research is required to gain global understanding of the aquatic ecosystems and should rely upon large-scale integration and coordination of activities. New methodological approaches to integrated ecosystem conservation are being developed. These include the development of coastal and hinterland planning

techniques (overlay mapping, geographical information systems, etc.), new concepts for biosphere reserves and integrated management of coastal and inland multiple-use resources.

85. An increasing number of countries in the region are entering into the process of integrated ecosystems management. The know-how gained in these programmes is not readily available to other countries showing similar interests. There is therefore a need to improve the exchange of experiences with regard to the management of integrated resources systems and to foster technical cooperation (TCDC) within the region by strengthening appropriate mechanisms. This long-term process can be eased by taking more advantage of existing institutional set-ups, such as the United Nations Educational, Scientific and Cultural Organization (UNESCO)/COMARAF regional environment programmes, the United Nations Environment Programme (UNEP) west and central, and east regional seas bodies in this area.

2. Development planning and programming

86. The adoption by numerous countries of the region of important economic and sectoral policy reforms has necessitated the strengthening of the analytical and planning capability of relevant organs of government, including fishery departments, and the training of their staff to carry out the necessary diagnostic analyses to formulate appropriate policies and programmes.

87. To promote successful development, attention should be paid to the formulation of fishery development strategies and plans that will enable Governments to make policy decisions on the basis of facts, to apportion their available natural, human and financial resources more effectively, and to identify and develop a rationale for external assistance requests within the context of a fishery development plan.

88. FAO, with the support of its technical cooperation programme as well as UNDP funding, has over the last five years strengthened its support for the formulation of comprehensive fishery plans 3/ soundly based on sectoral studies, which have, in turn, clearly identified policy issues together with potentials and constraints of the sector and which have been endorsed, in most cases, by the various representatives of the fishery industry through the holding of national fishery-planning seminars.

89. In recent years, regional projects (e.g. CECAF, SWIOP) have substantially contributed to building up planning capabilities by upgrading the skills of officials involved in fishery development planning, by strengthening training institutes, by developing and expanding methodological material and by providing support in project formulation, monitoring and evaluation as well as in the use of computer packages for financial and economic analysis. It can be noted that only one project of this type is currently being executed in the region, namely, the IFIP project.

90. The range of economic and technical subject-matters that comprehensive planning must take into consideration is extremely broad. It includes, for example, strengthening coordination with regard to foreign fishing, not only at an operational level, but also with respect to the preparation, negotiation and adoption of fishing agreements, defining common positions in international forums in which fishery issues are discussed, for example, the international trade discussions within the General Agreement on Tariffs and Trade and the EEC/African, Caribbean and Pacific (ACP) arrangements.

3. Training

91. One of the principal aims of technical assistance is to strengthen national capabilities. The replacement of foreign experts by nationals through progressive training will only be achieved if there is a firm commitment by Governments to ensure that trained nationals are placed in appropriate positions and provided with facilities and inducements to perform the functions for which they have been trained. This also demands that proper manpower planning is undertaken and that government establishments are appropriately structured and that extension and training for fishermen be strengthened.

92. Currently, existing fishery regional training centres (e.g the Institut supérieur des Sciences halieutiques et techniques" in Mauritania, the Centre des Pêches continentales et de la pisciculture in Côte d'Ivoire, both supported by the West African Economic Community (CEAO) and the African Regional Aquaculture Centre in Nigeria supported by the Economic Community of West African States, are not used to their full capacity. The flux of the majority of fishery trainees is still towards training courses outside the region, as encouraged in some cases by externally assisted projects or through specific provision in some access fishery agreements.

93. Such regional centres do not yet exist in East Africa, although the Southern African Development Coordination Conference (SADCC) has for many years formulated projects in this respect. Another option could be to regionalize existing centres of excellence, as strongly recommended by the session in May 1991. The rationale is to harmonize the level of knowledge among scientists and decrease investment and running costs. Such an initiative has, for example, already been taken by Morocco, which has recently regionalized its IAV II training centre.

94. Shorter-term initiatives to respond to circumstantial needs should also be developed, such as the three-year interregional training programme on quality assurance of fish and fisheries products, which FAO has launched in collaboration with INFOPECHE.

95. More generally, the exchange of expertise at regional or subregional levels should be promoted. To be more effective, such collaboration requires adequate follow-up activities and support.

4. Technology transfers and support to private entrepreneurs

96. Private sector initiatives in fisheries and aquaculture need to be more effectively promoted through appropriate programmes.

97. The early involvement of operators in industry, trade and other enterprises in technical and economic cooperation and the transfer of know-how should be further encouraged, particularly through the transfer of already proven successful technology from other African countries.

98. Favourable environments for investment should be developed through adequate mechanisms including provision of credit and finance, as well as guarantees and subsidies where appropriate to encourage private sector activities. The fishery sector, for example, is rarely fully taken into consideration in the African investment codes. An effort at subregional level, through competent economic groupings, effectively to harmonize taxation, customs and other fiscal regulations as well as establish compensatory mechanisms for fishery products could rapidly lead to an increase of interregional fish trade in Africa.

99. Other incentives at a regional level for promoting private investment may be in the form of more comparative studies analysing costs, earnings, internal rates of return for different operating scales to assist the private sector in making optimal technology choices and to promote joint venture initiatives within a country or a subregion.

100. African countries grouped within a subregion have often reached unbalanced levels of development (e.g. fleets, capital, manpower, harbour infrastructures, etc.). A wide range of complementarities exist for mutual benefits, for example, through technology transfers from one African country to another. For example, popularization of sails, outriggers and floatation is an urgent need in several African countries; downstream, new product development and improvement of processing structure, quality of products and labels for African fishery products are areas where joint private initiative could be developed further.

101. Those technologies being considered for transfer must fit into local receiving economies. In the case of technologies required to harvest offshore resources, principal design criteria must include adequate safety at sea, balanced labour intensiveness and low foreign exchange demand. The key to meeting criteria will lie, in most cases, in effective research and development at local levels to improve existing technologies and available material.

5. Coordination of regional and subregional fishery programmes

102. The current trend towards more integrated regional approaches for the development of African fisheries means increasing reliance on, and effectiveness and coordination of, regional and subregional institutional mechanisms dealing with fishery issues and problems. Within the region or at subregional level, the coordination of cooperation in fisheries is conducted mainly through marine and inland fishery bodies, economic cooperation organizations as well as regional field projects. Table 4 shows membership of African countries in fishery bodies and economic groupings.

Table 4. Membership in fishery bodies and economic groupings

Countries	United Nations regional fishery bodies				Regional economic groupings										Intergovernmental fishery organizations					Organization on watershed drought management			
	RFA	IOFC	CECAF	CIFA	ECOWAS	CEAO	PTA	SADCC	MRU	IGC	CEPGL	OAU	UDEAC	ECCAS	ICCAT	COREP	SRCP	WC	WIOTO	ICSC	CILSS	IGADD	ABDA
Angola	X							X				X			X			X					
Benin	X		X	X	X							X			X								X
Botswana	X			X				X				X											
Burkina Faso	X					X						X									X		X
Burundi	X			X			X				X	X		X									
Cameroon	X		X	X								X	X				X	X		X			X
Cape Verde	X		X		X							X			X			X			X		
Central African Republic	X			X								X	X	X									
Chad	X			X								X	X	X						X	X		X
Comoros	X	X					X			X		X							X				
Congo	X		X	X								X	X	X		X		X					
Côte d'Ivoire	X		X	X	X	X						X			X			X					X
Djibouti	X						X					X										X	
Equatorial Guinea	X		X									X	X	X		X		X					
Ethiopia	X	X		X			X					X										X	
Gabon	X		X	X								X	X	X	X			X					
Gambia	X		X	X	X							X					X	X					
Ghana	X		X	X	X							X			X			X					
Guinea-Bissau	X		X		X							X					X						
Guinea	X		X		X				X			X											
Kenya	X	X		X			X					X											
Lesotho	X						X	X				X											
Liberia			X		X				X			X											
Madagascar		X		X						X		X											

Table 4 (continued)

Countries	United Nations regional fishery bodies				Regional economic groupings										Intergovernmental fishery organizations					Organization on watershed drought management			
	BCA	IOFC	CECAF	CIFA	ECOWAS	CEAO	PTA	SADCC	MRU	IGC	CEPGL	OAU	UDEAC	ECCAS	ICCAT	CORPP	SRCP	WC	WIOFD	LCBC	CILSS	IGADD	NRBA
Malawi				X			X	X				X											
Mali	X			X	X	X						X									X		X
Mauritania	X		X		X	X						X					X	X			X		
Mauritius	X	X		X			X			X		X							X				
Morocco	X		X												X			X					
Mozambique	X	X						X		X		X							X				
Namibia	X							X										X					
Niger	X			X	X	X						X								X	X		X
Nigeria	X		X	X	X							X						X		X			X
Réunion	X									X		X											
Rwanda	X			X			X				X	X											
Sao Tome and Principe	X		X									X			X	X	X	X					
Senegal	X		X	X	X	X						X			X			X			X		
Seychelles	X	X								X		X							X				
Sierra Leone	X		X	X	X				X			X						X					
Somalia	X	X		X			X					X										X	
South Africa															X								
Sudan	X			X								X										X	
Swaziland	X			X			X	X				X											
Togo	X		X	X	X							X						X					
Uganda	X			X			X					X										X	
United Republic of Tanzania	X	X		X			X	X				X							X				
Zaire	X		X	X							X	X				X		X					

Table 4 (continued)

Countries	United Nations regional fishery bodies				Regional economic groupings										Intergovernmental fishery organizations					Organization on watershed drought management			
	ECA	IOFC	CECAF	CIFA	ECOWAS	CEAO	PTA	SADCC	MRU	IOC	CEPGL	OAU	UDEAC	ECCAS	ICCAT	COREP	SRCF	MC	WIOTO	LCBC	CILSS	IGADD	NBRA
Zambia	X			X			X	X				X											
Zimbabwe	X		X			X	X					X											
Year of establishment	1948	1967	1967	1971	1975	1974	1981	1980	1973	1984	1976	1984	1964	1983	1966	1984	1985	1988	1990	1964	1973	1986	1964

ECA Economic Commission for Africa
IOFC Indian Ocean Fishery Commission (member countries include 10 European, Asian and near-east countries)
CECAF Fishery Committee for the Eastern Central Atlantic (member countries include 10 non-African countries)
CIFA Committee for Inland Fisheries of Africa
ECOWAS Economic Community of West African States
CEAO West African Economic Community
PTA Preferential Trade Area for Eastern and Southern Africa
SADCC Southern African Development Coordination Conference
MRU Mano River Union
IOC/AT Indian Ocean Commission/Association thonière
CEPGL Communauté économique des pays des grands lacs
OAU Organization of African Unity
UDEAC Customs and Economic Union of Central Africa
ECCAS Economic Community of Central African States
ICCAT International Commission for the Conservation of Atlantic Tuna (member countries include 12 other non-African countries)
COREP Regional Fishery Committee for the Gulf of Guinea
SRCF Subregional Commission for Fisheries (north-west Africa)
MC Ministerial Conference on Fisheries Cooperation among African States bordering the Atlantic Ocean
WIOTO Western Indian Ocean Tuna Organization
LCBC Lake Chad Basin Commission
CILSS Comité permanent inter-Etats de lutte contre la sécheresse dans le Sahel
IGADD Intergovernmental Authority on Drought and Development
NBRA Niger River Basin Association

(a) Regional fishery bodies and economic groupings

103. With regard to the marine sector, the role of regional fishery bodies was recognized in the 1982 United Nations Convention on the Law of the Sea. In particular, the Convention contains a number of provisions regarding cooperation among coastal States and competent international organizations whether subregional, regional or global, with respect to conservation and exploitation of living resources.

104. Traditionally, cooperation in marine fisheries in the region through fishery bodies has been carried out by the FAO regional bodies (i.e. CECAF and its subcommittees and working parties, the Indian Ocean Fishery Committee and especially its south-west Indian Ocean subcommissions established under regional projects) or by non-FAO fishery commissions such as the International Commission for the Conservation of Atlantic Tuna and the International Commission for the South-East Atlantic Fisheries.

105. In recent years, the number of intergovernmental organizations concerned with marine fisheries has increased. New organizations have been created in West Africa, namely, the Regional Fishery Committee for the Gulf of Guinea in 1984, SRCF (for north-west Africa) in 1985, the Ministerial Conference on Fisheries Cooperation among African States bordering the Atlantic Ocean in 1989, as well as in East Africa with respect to tuna species, for example, the Western Indian Ocean Tuna Organization in 1990, or the Association thonière in 1991, as a subsidiary body of the Indian Ocean Commission.

106. With regard to inland fisheries, the FAO Committee for Inland Fisheries in Africa, and its three subcommittees (for the Sahelian fisheries, for Lake Tanganyika and for Lake Victoria respectively), is the only fishery body dealing exclusively with the management and development of fisheries in rivers, flood plains and international lakes.

107. Regional economic integration organizations are also showing major interest in fishery development. Generally, their primary objective rests with the suppression among their members of economic discrimination (customs barriers, movement of goods and persons, fiscal regulations, etc.). Although for many economic groupings and watershed and drought organizations fisheries is a marginal area of competence, most of these regional institutions are specifically entrusted with the promotion of fisheries development, in particular the harmonization of fishery policies.

108. The membership of regional economic groupings is, in general, based on linguistic, economic or political affinities and does not always coincide with natural management areas. These bodies have, therefore, some difficulties in providing, from a strictly technical point of view, an adequate framework for cooperation in the proper management of fish stocks. Their activities are generally diluted within a broader development scope resulting in reduced potential decision-making power in fishery matters. Only a few of these groupings (e.g. SADCC, the Lake Chad Basin Commission and the Customs and Economic Union of Central Africa (UDEAC)) actually have specialized fishery personnel, which results in a general lack of technical support.

109. Since resources are limited, it is important to avoid their dissipation and to ensure better coordination and specialization of regional efforts, particularly among those economic groupings in which fishery management areas are overlapping. This would certainly improve the overall efficiency of the regional institutional system for cooperation in fisheries. Given the strong link and economic preferences among their members, the groupings will be able to play a greater role in the fishery development process with major technical support from the fishery bodies and reinforced links between advisory and decision levels.

110. In order to equip fishery bodies and economic groups to deal more effectively with shared stocks and other issues of common concern, it will be necessary to enact fundamental changes concerning their structures and purpose. Some fishery bodies have already taken important initiatives in this direction.

111. On the one hand, suitable institutional frameworks to determine policies, stimulate political will and promote subregional and regional collaboration at the highest levels are required. In this respect, it is an encouraging sign that an increasing number of African countries are taking measures to strengthen their capabilities for cooperation in fisheries, and that these efforts are showing a broader purpose and scope with greater attention to policy-making, as well as resource management and development in the widest sense. Although many examples could be cited, the recent initiative of the newly established Ministerial Conference on Fisheries Cooperation among African States bordering the Atlantic Ocean (see below) illustrates this trend.

112. On the other hand, it is also essential to strengthen mechanisms to ensure coordination of activities, advisory services, backstopping and follow-up, particularly for questions relating to statistics and data, training, management of shared stocks, harmonization of legislation and marketing.

(b) <u>The Ministerial Conference on Fisheries Cooperation among African States bordering the Atlantic Ocean</u>

113. The Ministerial Conference offers an interesting example of a new policy coordination mechanism. The Ministerial Conference was held in March-April 1989 at Rabat with the objective of discussing all aspects of cooperation in fisheries among the 22 African States situated along the Atlantic coast from Morocco to Namibia. The Ministers responsible for the fishery sectors in the region and 10 international and regional organizations participated. By participating in this Conference, the States of the region resolved to cooperate actively in accordance with their wish to make the fishery sector a strategic component of their economic and social development.

114. At the end of the Conference, the Ministers adopted the Rabat Declaration, expressing the will of all States in the region to strengthen and develop cooperation, particularly in the following fields: assessment and conservation of fishery resources as well as the promotion of marine

scientific research; development of fishery production and infrastructure; marketing of fishery products; enhancement of vocational and technical training; solidarity with land-locked and other geographically disadvantaged African States.

115. The Ministerial Conference also decided to set up a follow-up committee entrusted with the task of seeking the means to permit the implementation of the recommendations formulated by the Conference. The follow-up committee mounted missions to FAO, UNDP, the Office for Ocean Affairs and the Law of the Sea of the Secretariat, the International Maritime Organization (IMO), UNEP, the United Nations Industrial Development Organization (UNIDO), ECA, the United Nations Conference on Trade and Development (UNCTAD), ICOD and EEC to solicit the cooperation of these organizations. FAO pledged a technical cooperation project to assist the follow-up committee to prepare its meeting, which was held in May 1990. At that time, it presented a programme of action comprising a wide range of regional cooperation projects, including resource management and development planning for fisheries in the region, an inventory of capacities and needs of the region as regards training and marine research, cooperatives of the region, creation of a regional maritime database under the coordination of ECA, establishment of a regional register of vessels, the development of the fishing industry, and the coordination of monitoring, control and surveillance activities of fishing vessels. Further, a meeting of legal experts was held at Rome in May 1991 to discuss a draft convention prepared by the follow-up committee.

116. The second session of the Ministerial Conference was held at Dakar in July 1991 with support from EEC and FAO. The highlight of this Conference was the adoption of the Regional Convention on Fisheries Cooperation among African States bordering the Atlantic Ocean and the adoption of the Programme of Action. This Programme groups all ongoing, pipeline and new projects with provision for a coordinating mechanism and is designed to have subprogrammes and projects.

117. FAO was designated depository of the Convention and was requested to provide interim institutional support pending the establishment of a permanent secretariat of the Conference. FAO is currently cooperating with the interim secretariat in following up the recommendations of the Conference. Workshops on the maritime data bank, on monitoring, control and surveillance, and on institutional options for the establishment of a permanent secretariat for the Conference will be held in the region during 1992. Planning and programming activities will also be undertaken as well as other activities recommended by the Conference. In February 1991, the following countries signed the Convention: Congo, Morocco, Senegal, Togo and Zaire.

(c) Programme approach for the development and management of African fisheries

118. More effective steps could be taken towards facilitating the coordination of activities in fisheries and related fields (e.g. oceanography and environmental research) and for providing, as necessary, technical

backstopping for cooperation (TCDC, ECDC) and advice on issues common to several countries where particular benefits such as economies of scale, optimal use of expertise and means can be derived from concerted approaches.

119. The regional aid programmes consisting of existing and pipeline technical regional fishery projects constitute a comprehensive network for promoting the development of African fisheries in the short and medium term. This programme approach, if properly backed by relevant fishery bodies in close coordination with concerned economic groupings and adequately supported by the donor community, offers many advantages. It makes it possible to have an overall and better understanding of fishery development opportunities and management requirements, at both national and subregional levels. Existing regional projects, as well as those in the pipeline, would find their place under the relevant subprogrammes without losing any of their individual character. Gaps where subregional action is required could be immediately evident, not only to countries in the area but also to multilateral and bilateral donors. Duplication of effort will be easier to avoid and needs for coordination made more visible. Such an approach would also facilitate overall monitoring, evaluation and eventual reorientation of activities.

120. Pooling of efforts through ongoing regional projects is developing rapidly and should be further encouraged. This is visible, for example, in the eastern/central/southern African region where close coordination, including exchange of data and expertise among four projects, 4/ provides enhanced delivery and effectiveness for developing the Rift Valley fisheries, as well as in West Africa where the promotion of integrated activities among three regional projects 5/ and their related national projects facilitates similar results for the development of small-scale fisheries.

121. The above-mentioned Ministerial Conference also adopted at its second session in July 1991 a programme approach for its areas of competence. As it is probable that the regional programming approach in fisheries will gain impetus in various African subregions, it may be advisable to keep these developments under review.

IV. CONCLUSION

122. The fishery sector in Africa is currently generating considerable social and economic benefits. It can be considered one of the healthier sectors in Africa with economic indicators showing positive trends. However, in order to maintain and develop this performance without further endangering the resource base, development planning and resource management efforts should be urgently reinforced, both at national and regional levels. New challenges, such as increased African participation in marine production and in the international trade of fish and fishery products, should also be faced.

123. To develop further both inland and marine fisheries, greater collaboration among countries concerned could be beneficial, particularly by making more use of the existing institutional framework for fishery

cooperation, namely, regional and subregional fishery bodies, regional economic groupings with competence in fisheries and regional projects.

124. Intergovernmental cooperation mechanisms at subregional and regional levels are gradually evolving and adapting to the new challenges. However, the development of the fishery sector in Africa is hindered by slow implementation of policy and scientific guidelines recommended by the intergovernmental fishery bodies, coupled with the fact that regional programmes are experiencing increasing difficulties in obtaining funding.

V. RECOMMENDATIONS

125. Higher priority should be given by African Governments to the development of fisheries and aquaculture, bearing in mind the potential contribution of the fishery sector to African economic, social and nutritional goals.

126. African States, with a view to ensuring supply of fish products to feed present and future populations, should adopt effective fishery planning and management standards, which, within the context of sustainable development, will promote the maintenance of the quantity, quality, diversity and economic availability of fishery resources.

127. Greater reliance should be put on subregional approaches for priority issues of common concern such as the compilation and dissemination of fishery statistics, resource evaluation, fishery management and other issues, which need to encompass stocks, socio-economic activities and ecosystems in their totality, that is, which ensure sustainable utilization of fishery resources in harmony with the environment.

128. Applied and strategic research programmes aiming at improving the national, subregional and regional capabilities and self-reliance of African countries in fishery planning, management and development should be intensified, particularly to address the severe problems of excess fishing capacity in many of the African fisheries.

129. Regional collaboration in fishery management and development through reinforced collaboration of existing regional fishery bodies in Africa should be emphasized and Governments concerned should increase their efforts towards implementing the policy and scientific guidelines recommended by the intergovernmental bodies dealing with fishery issues.

130. Efforts to monitor economic and social impacts, that is, to quantify the existing and potential contribution of fisheries to African GNP, should be supported through adequate programmes, to include enhancing and harmonizing relevant statistical and information bases, and devising options and strategies at both national and subregional levels for generating maximum social and economic benefits from the various African fishery subsectors.

131. Comprehensive analysis should be undertaken to better identify the constraints to and prospects for aquaculture development in Africa.

132. A greater portion of fish export earnings should be used for importing fish or necessary fishing inputs to increase the productivity of small-scale fishermen.

133. Multilateral technical cooperation organizations and financial institutions should strengthen their capacity and cooperation for assisting African countries in facing new challenges in fisheries, particularly with respect to the management of fishery resources and the development of fish markets.

134. Bilateral and multilateral donors should put greater emphasis on, and give longer-term support to, regional technical assistance projects and programmes and facilitate procedures for the pooling of financial resources.

135. Cooperation among African countries should be strengthened with regard to foreign fishing at operational level but also with respect to the preparation and negotiation of fishery agreements, and the definition of a common position in international forums such as GATT and the EEC/ACP arrangements.

136. The exchange of available African expertise at subregional and regional levels should be promoted, as well as a more effective use of regional training centres.

137. Regional and subregional coordination mechanisms and specialization of development activities and efforts in fisheries and related fields should be reinforced, particularly among those economic groupings and fishery bodies in which fishery management areas overlap, with a view to avoiding dissipation of scarce financial resources.

Notes

1/ The present report concerns sub-Saharan Africa. Mediterranean countries (Egypt, Algeria, the Libyan Arab Jamahiriya, Tunisia) are not included.

2/ Report of the Nineteenth Session of the FAO Committee on Fisheries, Rome, 8-12 April 1991. FAO Fisheries Report No. 459, para. 14.

3/ This assistance was provided at national level (e.g. in Burundi, Madagascar, United Republic of Tanzania, Sierra Leone, Rwanda, Ethiopia, Cameroon, Guinea-Bissau) as well as at subregional level, i.e. to the Lake Chad Basin Commission, to the member States of the South-West Indian Ocean Fisheries Subcommittee of the Indian Ocean Fishery Committee, to the member States of the CIFA Subcommittee of the Indian Ocean Fishery Committee to the member States of the CIFA Subcommittee for the Protection and Development of Fisheries in the Sahelian Zone, to the Economic Community of West African States, and to the Intergovernmental Authority on Drought and Development.

Notes (continued)

4/ These are the aquaculture for local community development programme; the regional project for inland fisheries planning, development and management in eastern/central/southern Africa (IFIP); the newly established research for the management of the fisheries on Lake Tanganyika project; and the regional project for research on applied hydrobiology.

5/ These are the integrated development of artisanal fisheries project; the regional fish trade information and cooperation services (INFOPECHE); and the reduction of post-harvest losses in West African fisheries.